

REMARKS/ARGUMENTS

The arguments and amendments submitted herein incorporate the patentability arguments and amendments Applicants discussed with the Examiner during the phone interview on January 24, 2007. Applicants submit that the arguments presented herein make the substance of the phone interview of record to comply with 37 CFR 1.133. During the interview and in the Interview Summary the Examiner submitted on February 1, 2007, the Examiners said they would consider allowing the claims if the requirements of claim 7 were added to the independent claims. Applicants amended the claims as discussed and distinguish the amended claims over the cited art for the reasons discussed herein.

1. Claims 1-6, 8, 9, 11-17, 19, 20, and 22-30 are Patentable Over the Cited Art

The Examiner rejected claims 1-6, 8, 9, 11-17, 19, 20, and 22-30 as anticipated (35 U.S.C. §102(b)) by Downer (U.S. Patent No. 6,223,244). Applicants traverse.

Amended claim 1 recites signaling, as part of a diagnostic operation with respect to an Input/Output (I/O) controller, a reconnection inhibitor over a bus to cause the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus; transmitting as part of the diagnostic operation, by an initiator, I/O requests on the bus to the I/O controller, wherein the I/O requests are queued in an I/O queue, wherein the I/O controller is inhibited by the reconnection inhibitor from draining the queue while the initiator transmits requests to the I/O controller; and performing diagnostic testing of the I/O controller when the I/O queue is at different levels, wherein the level of I/O requests pending in the I/O queue is controlled by the signaling of the reconnection inhibitor.

Applicants amended claim 1 to include the requirements of claim 7 as discussed during the phone interview, of performing diagnostic testing of the I/O controller when the I/O queue is at different levels. Applicants further amended claim 1 to include the requirement from claim 6 that the level of I/O requests pending the I/O queue is controlled by the signaling of the reconnection inhibitor to further clarify the distinctions of the claims over the cited art. Applicants submit that these amendments may be entered after final because they include requirements from pending claims, which the Examiners indicated distinguish over the cited art.

The Examiner cited the host 16 in FIG. 1 as disclosing the claimed reconnection inhibitor, which has the highest priority IDF, and the controller 18 of FIG. 1 as the claimed I/O

controller being diagnosed. The Examiner further cited col. 1, lines 46-47 and 53-65 of Downer. The cited col. 1 discusses the SCSI architecture where two devices communicate on a bus, and that hosts having the highest bus ID may initiate requests with minimal interference. (Final Office Action, pg. 4)

Although the cited Downer discusses how different devices can communicate on a SCSI bus and that the one with the highest priority is given access to the bus, the Examiner has not cited any part of Downer that discloses that a reconnection inhibitor (or device in claim 23) is signaled as part of a diagnostic operation with respect to an Input/Output (I/O) controller to cause the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus. Although the cited Downer discusses how a higher priority device accessing the bus can block lower priority devices from accessing the bus, the Examiner has not cited the claimed signaling as part of a diagnostic operation with respect to an I/O controller to inhibit the subject I/O controller from accessing the bus. Further, the cited Downer nowhere discloses the added claim requirement of performing diagnostic testing of the I/O controller when the I/O queue is at different levels, wherein the level of I/O requests pending the I/O queue is controlled by the signaling of the reconnection inhibitor.

Moreover, the Examiner has not cited any part of Downer that discloses that an initiator transmits I/O requests as part of a diagnostic operation to the I/O controller to be queued in an I/O queue while the I/O controller is inhibited from draining the queue. Instead, the cited Downer discusses how one device with a higher priority ID may prevent other devices from accessing a SCSI bus. Further, there is no disclosure that the initiator signals a reconnection inhibitor to control the levels of I/O requests pending in the I/O queue as part of diagnostic testing.

Downer further discusses how certain devices of higher priority may prevent other initiators of lower priority from accessing the bus, which must wait for the bus to become free before retrying access, and discusses various solutions to the "starvation" problem so that the lower priority devices can be given their share of access. (Downer, col. 4, line 12 to col. 5, line 15). However, the Examiner has not cited any part of Downer that discloses that a reconnection inhibitor (or device for claim 23) is signaled as part of a diagnostic operation with respect to an Input/Output (I/O) controller to cause the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus so that an initiator may submit I/O requests while the I/O

controller is inhibited to build the I/O queue by preventing the I/O controller from accessing the bus to drain the I/O queue. Further, there is no disclosure in the cited Downer of the claim requirement that the initiator signals the reconnection inhibitor (or device of claim 23) to control the levels of I/O requests pending in the I/O queue as part of diagnostic testing. Instead, the cited Downer discusses operations to prevent higher priority devices from keeping lower priority devices off the bus to avoid undesirable "starvation".

The Examiner cited col. 7, lines 50-54 and steps 62 and 64 as disclosing the requirements of claims 7 and 18 added to the independent claims, which recited performing diagnostic testing of the I/O controller when the I/O queue is at different levels. (Final Office action, pg. 8) Applicants traverse.

The cited col. 7 mentions that an initiator checks to see if the ping of a lower priority initiator succeeds. If the ping fails, the pinged initiator is considered invalid and remains so until a ping is received. This cited ping checking operation is part of an operation to prevent initiator starvation. (Downer, col. 4, lines 24-67). Nowhere does the cited col. 7 anywhere disclose the claim requirement of performing diagnostic testing of the I/O controller when the I/O queue is at different levels by controlling the reconnection inhibitor (or device of claim 27). Instead, the cited Downer discusses determining if an initiator is valid as part of determining whether a starvation prevention operation should be performed. Nowhere does the cited col. 7 mention performing pinging as part of diagnostic testing of the I/O controller to test the I/O queue at different levels, controlled by the reconnection inhibitor.

Moreover, nowhere does the cited col. 7, which discusses pinging to check whether an initiator is valid, anywhere disclose the claim requirement of performing diagnostic testing when the I/O queue is at different levels. The pinging is done to determine whether the initiator is invalid, not to test when the I/O queue is at different levels as claimed.

Yet further, even if one views the pinging as testing of an initiator, the claims concern testing a device, the I/O controller, that is not signaled. Instead the claim recites signaling the reconnection inhibitor to control the level of I/O requests pending in the queue processed by the I/O controller. The Examiner has not cited any part of Downer that discloses signaling one device (a reconnection inhibitor) to control I/O queue levels for the purpose of diagnostic testing of a different device, the I/O controller.

Accordingly, Applicants submit that amended claim 1 is patentable over the cited Downer because the cited Downer does not disclose all the claim requirements.

Amended claims 12 and 23 substantially include the requirements of claim 1 in system and device format. The Examiner cited the same sections of Downer with respect to claims 12 and 23. In claim 23, the “device” element performs the operations of the “reconnection inhibitor” of other claims. Accordingly, Applicants submit that amended claims 12 and 23 are patentable over the cited Downer for the reasons discussed with respect to claim 1.

Claims 2-6, 8, 9, 11, 13-17, 19, 20, 22, and 24-30 are patentable over the cited art because they depend from one of claims 1, 12, and 23. The following dependent claims provide additional grounds of patentability over the cited art.

Claims 2, 13, and 24 depend from claims 1, 12, and 23 and additionally require that the initiator accesses the bus at a higher priority than the reconnection inhibitor, and wherein the reconnection inhibitor accesses the bus at a higher priority than the I/O controller.

The Examiner cited the above discussed sections of Downer which discuss how devices may be assigned different priorities, some higher than the others, such that higher priority devices may access the SCSI bus over lower priority devices. (Final Office Action, pg. 5)

Although the cited Downer discusses SCSI priority in general, the Examiner has not cited any part of Downer that discloses assigning a highest priority to an initiator that submits I/O requests to an I/O controller, which is assigned the lowest priority, as part of a diagnostic operation while a reconnection inhibitor (or device for claim 24), having a lower priority than the initiator and higher priority than the I/O controller, inhibits the I/O controller from draining the I/O queue. For instance, the cited Downer discusses how a host may have the highest SCSI priority (ID) and other devices lower priorities. However, the claims require a specific assignment of bus priority to devices performing specific functions in a diagnostic operation with respect to the I/O controller. The cited Downer's general discussion of priority assignment for SCSI bus access does not disclose the specific claimed assignment of priorities to specific devices involved in a diagnostic operation as claimed.

Accordingly, the additional requirements of claims 2, 13, and 24 provide additional grounds of patentability over the cited art.

Claims 5 and 16 depend from claims 1 and 12 and further require signaling the reconnection inhibitor to cease accessing the bus, wherein the I/O controller accesses the bus to

complete processing of an I/O request and process further I/O requests in the I/O queue in response to the reconnection inhibitor ceasing to issue requests on the bus. Claim 27 depends from claim 23 and recites receiving the signal to cease accessing the bus.

The Examiner cited col. 1, lines 61-65 and col. 2, lines 8-12 of Downer as disclosing the additional requirements of these claims. (Final Office Action, pg. y) Applicants traverse.

As discussed, the cited col. 1 discusses how different devices have different SCSI priorities that are used to control their access to bus, such that devices having a higher priority may access the SCSI bus over devices with a lower priority. The cited col. 2 mentions that the winning device (of higher priority) must proceed through additional phases to complete its task and the losing device (lower priority) must wait for the bus to achieve another bus free phase.

Nowhere do the cited cols. 1 and 2 anywhere disclose that a reconnection inhibitor (or the device in claim 27), previously signaled to access a bus to inhibit an I/O controller access as part of a diagnostic operation, is further signaled to cease accessing the bus to allow the I/O controller to access the bus to complete processing queued I/O requests. Instead, the cited Downer discusses priority access of a SCSI bus in general and how a lower priority device must wait until the bus is free from higher priority devices before being able to access the bus. This does not disclose the specific claimed bus access operations as part of a diagnostic operation as claimed.

Accordingly, the additional requirements of claims 5, 16, and 27 provide additional grounds of patentability over the cited art.

Amended claims 6, 17, and 28 depend from claims 5, 16, and 27 and further require that the I/O queue is increased by signaling the reconnection inhibitor to access the bus to inhibit the I/O controller from accessing the bus and depleting the I/O queue, and wherein the I/O queue is decreased by signaling the reconnection inhibitor to cease accessing the bus to inhibit the I/O controller.

Applicants amended these claims to remove the limitation "that the level of I/O requests pending in the I/O queue is controlled by signaling the reconnection inhibitor", which removed limitation was added to the independent claims 1, 12, and 23.

The Examiner cited the col. 2, lines 6-12 and the general elements, such as a host, etc. of Downer as disclosing the additional requirements of these claims. (Final Office Action, pgs. 7-8) Applicants traverse.

As discussed, the cited col. 2 mentions that the winning device (of higher priority) must proceed through additional phases to complete its task and the losing device (lower priority) must wait for the bus to achieve another bus free phase.

Although the cited Downer discusses how one device, such as a host, may access the bus over lower priority devices and that lower priority devices must wait for the bus to be free, nowhere does the cited Downer disclose controlling the level of I/O requests in a queue by signaling a reconnection inhibitor (or device for claim 28). The Examiner has not cited any part of Downer that discloses increasing the I/O queue by signaling the reconnection inhibitor to inhibit I/O controller access to the bus and decreasing the I/O queue by signaling the reconnection inhibitor to cease accessing the bus. Instead, the cited col. 2 mentions in general how a higher priority device may block a lower priority device from the queue and the lower priority device must wait for the bus to be free before attempting to gain control of the bus. This does not disclose the specific claim requirements of how to increase and decrease an I/O queue level by signaling a reconnection inhibitor to access or cease access to inhibit or not inhibit the I/O controller from accessing the bus.

Accordingly, the additional requirements of claims 6, 17, and 28 provide additional grounds of patentability over the cited art.

2. Claims 10, 21, and 31 are Patentable Over the Cited Art

The Examiner rejected claims 10, 21, and 31 as obvious (35 U.S.C. §103) by Downer in view of Merchant (U.S. Patent Pub. No. 2004/0230764). (Final Office Action, pgs. 11-12)

Applicants submit that these claims are patentable over the cited art because they depend from one of claims 1, 12, and 23, which are patentable over the cited art for the reasons discussed above.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-6, 8-17, and 19-31 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0449.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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